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# SOUTHERN YELLOW PINE FLOORING

*Specification and Design Information and  
Data for the Use of Architects  
and Engineers*

Technical Bulletin No. 1.

*Southern Pine Association*  
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## SOUTHERN YELLOW PINE FLOORING

### TABLE OF CONTENTS

QUALITY FLOORING  
KINDS OF FLOORING  
EDGE-GRAIN FLOORING  
FLAT-GRAIN FLOORING  
SIZES AND GRADES

STANDARD WORKING AND GRADES  
LENGTHS  
SHORT LENGTHS  
END MATCHED STRIPS  
PATTERN FLOORS

#### RECOMMENDED USE OF GRADES AND SIZES

MILL CONSTRUCTION—CLASS I  
MILL CONSTRUCTION—CLASS II  
COMMERCIAL CONSTRUCTION—CLASS I

COMMERCIAL CONSTRUCTION—CLASS II  
RESIDENTIAL CONSTRUCTION—CLASS I  
RESIDENTIAL CONSTRUCTION—CLASS II  
EXTERIOR PORCHES AND PLATFORMS

#### HOW TO LAY SOUTHERN YELLOW PINE FLOORS

PROTECTION  
SUB-FLOORS  
WOOD JOIST CONSTRUCTION  
NAILING  
EXTERIOR DECKING  
FIREPROOF ARCH CONSTRUCTION  
PITCH COAT  
CONCRETE FILL  
AMOUNT OF FLOORING REQUIRED

#### SPECIAL FLOORING PROBLEMS

### QUALITY FLOORING

BEAUTY, hardness and resistance to wearing are characteristics of the perfect floor. If, in addition, it is exposed to all of the changing conditions of weather on the exterior of the building, as an exposed porch flooring, appearance and life will depend upon durability and resistance to decay. Whether in the home, the school, the amusement hall, business building or factory, Southern Yellow Pine of the right type and grade, certified as to quality by the grade-mark of the manufacturer and the trade-mark of the Southern Pine Association, is a flooring which is beautiful and durable, reasonable in cost and satisfactory.

### KINDS OF FLOORING

SOUTHERN Yellow Pine flooring is manufactured in three general kinds: strip flooring in 25/32", 1-1/16" and 1-5/16" thicknesses; heavy plank flooring in 1-5/8", 2-1/8" and 2-5/8" and over thickness; and end-grain block flooring. The heavy flooring and block flooring are for use in commercial and industrial plants, barns, stables, foundries, viaducts, bridges and freight yards.\* The thicknesses specified are actual finished dimensions and conform to the American Lumber Standards.

Southern Yellow Pine strip flooring may be had in two distinct forms: quarter-sawed, variously known as edge-grained, vertical-grained, comb-grained, or rift-sawed; and flat-grained or slash-grained. See Figs. 1 and 2.

\*For heavy floors consult Bulletin No. 5 of this series.

### EDGE-GRAIN FLOORING

THE edge-grain flooring is so cut that the edge of the grain is presented as a wearing surface and possesses to a high degree the qualities that are demanded for a floor surface. It does not splinter, sliver or scratch and it is hard and extremely durable. It comes in long lengths, the full length of a room if desired. It holds a nail more tenaciously, it has been found, than most other woods. Properly nailed down, it stays nailed, flat and immovable; to the tread it gives the feel of solidity, and to the eye as well as the foot, appears to be all in one piece. Where resistance to decay and hard usage are factors, edge-grain flooring is available in heart-rift grades, which require the material to be free from sap on the face side. Because edge-grained Southern Yellow Pine floors can be given readily a beautiful finish, are not impaired by the wettings of periodical cleanings and are possessed of enduring wearing qualities, they are esteemed perfect floors for unusually severe usage, particularly in large areas.

### FLAT-GRAIN FLOORING

FLAT-GRAIN Southern Yellow Pine flooring, when cut from the same quality of logs, may be equally as hard as edge-grained or quarter-sawed stock, but it is generally less durable. Flat or slash-grained flooring can be selected for its special figure and makes an unusually interesting floor. Like the edge-grained flooring, the strips are manufactured uniform in



# Southern Pine Association

width, perfectly tongued and grooved, making a floor of perfect smoothness. Flat-grained flooring costs less than the edge-grained and where the highest grade of flooring is unnecessary for use in rooms that are carpeted or are not frequently subjected to moisture or heavy wear, these less expensive grades are suitable. As in edge-grained stock, flat-grained flooring can be finished in a beautiful natural golden color or stained in any desired color to harmonize with the furnishings and decorations.

## SIZES AND GRADES\*

SOUTHERN Yellow Pine flooring may be had in either edge-grain or flat-grain in any of the following standard (actual finished) sizes:

25/32" thick by 2-3/8" face.

25/32" thick by 3-1/4" face.

25/32" thick by 5-1/4" face and wider in flat-grain only.

For ball rooms, large stores, hotel or hospital corridors, which have very heavy or constant foot traffic, thicker stock, 1-1/16", 1-5/16" and 1-5/8", may be had in the same widths as 25/32" stock.

## STANDARD WORKING AND GRADES

The standard working of flooring for widths of 4" and under is surfaced two sides, matched

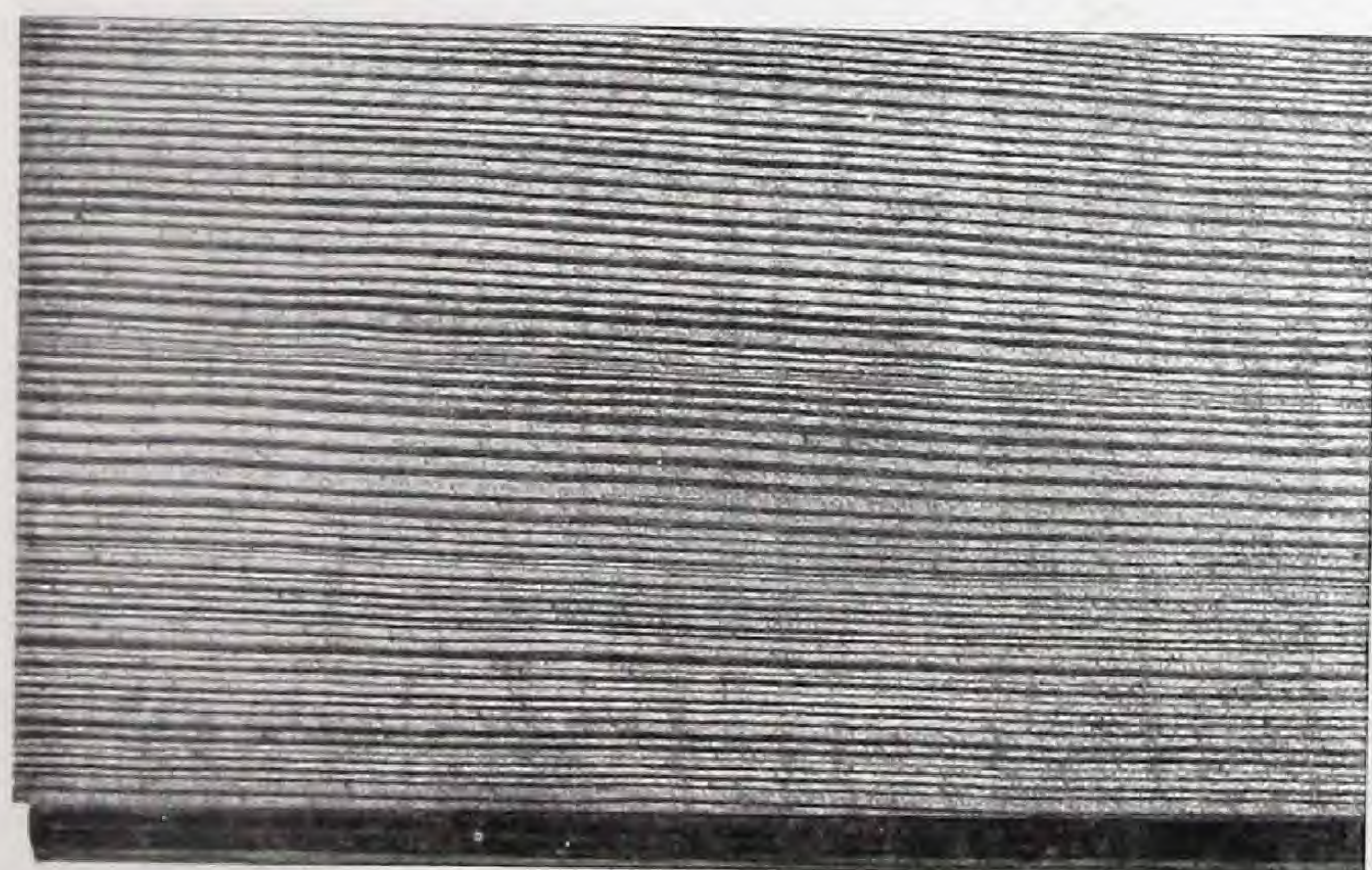


Figure 1—Edge-Grain Flooring

(see Fig. 3) and scratched or hollow back, with tongue and groove located 7/32" from the bottom of the piece.

Southern Yellow Pine flooring is graded as

\*The sizes and grades of the Southern Pine Association are in accordance with the American Lumber Standards as described in Simplified Practice Recommendation No. 16 of the U. S. Department of Commerce.

A, B, C, D, No. 1 Common and No. 2 Common in edge-grain material; and as A, B, C, D, No. 1 Common, No. 2 Common and No. 3 Sheathing in flat-grain material.†

## LENGTHS

Standard lengths are 4' to 20'. In B and Better shipments, not more than 5 per cent of 8' or 9' lengths are permitted; in C, D, and No. 1

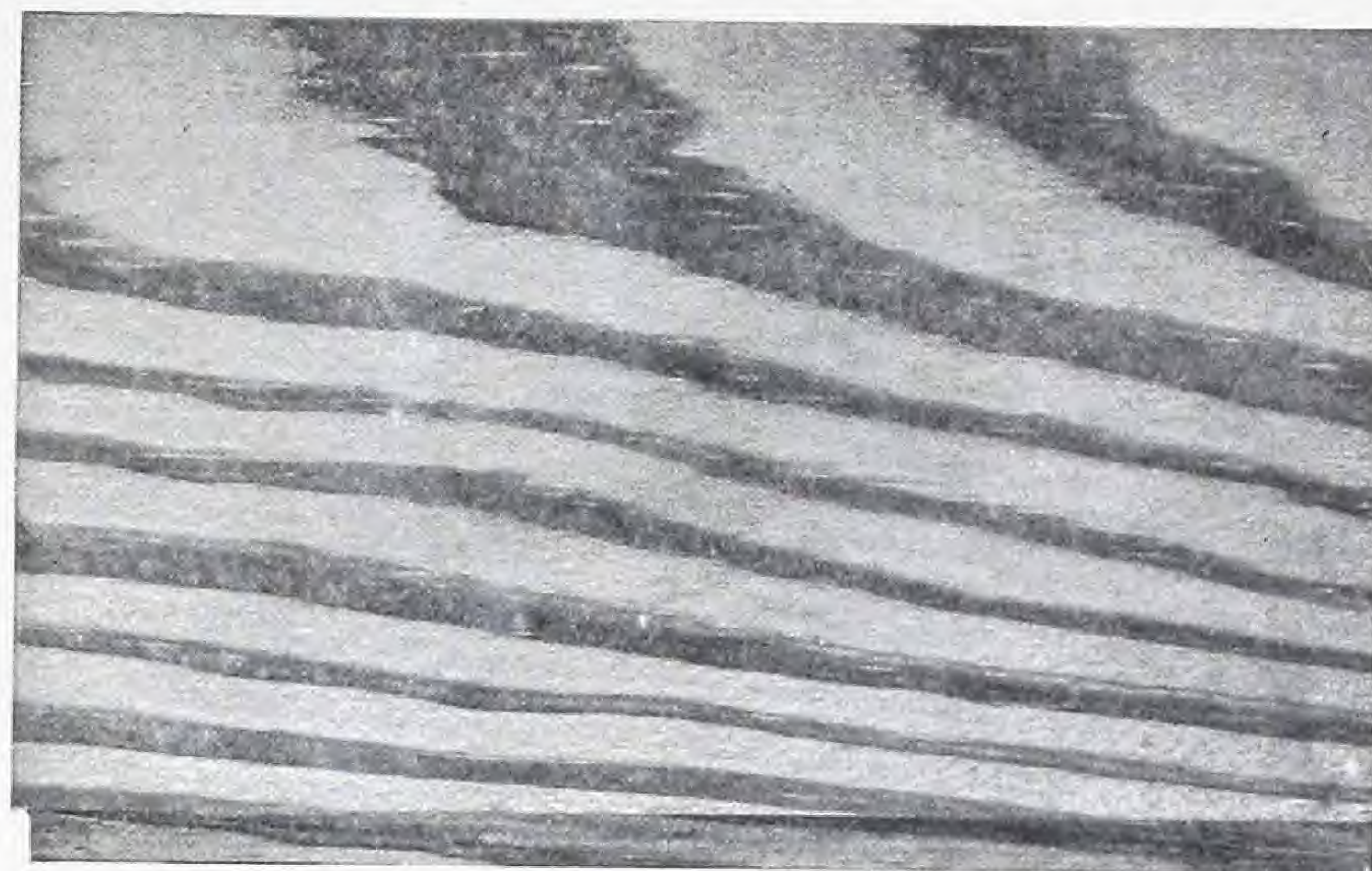


Figure 2—Flat-Grain Flooring

Common Grades, not more than 5 per cent of 8' or 9' lengths and 5 per cent of 6' or 7' lengths are permitted; in No. 2 Common not more than 5 per cent of 8' or 9' lengths, 5 per cent of 6' or 7' lengths, and 5 per cent of 4' or 5' lengths are permitted; and in No. 3 Sheathing, lengths of 4' to 20' inclusive with not to exceed 20 per cent of 4' and 6' lengths. These percentages of short lengths are customary and to aid conservation they are included as far as practicable in all shipments of mixed lengths.

## SHORT LENGTHS

As the lengths of standard flooring come in multiples of two feet the excess of short lengths together with the trim result in a waste of raw material, notwithstanding the tolerance permitted in the various grades. In the interests of conservation and complete utilization, some manufacturers of Southern Yellow Pine have developed the short, end-matched flooring, one foot to seven-feet or more in length, varying in multiples of six inches.

By this means, the trim waste is reduced to a minimum of six inches and, moreover, it is

†For details of these grades see the "Standard Specifications for Grades of Southern Pine Lumber."



# Southern Pine Association

possible to trim out defects of low grades to secure the higher grade material contained in the short piece.

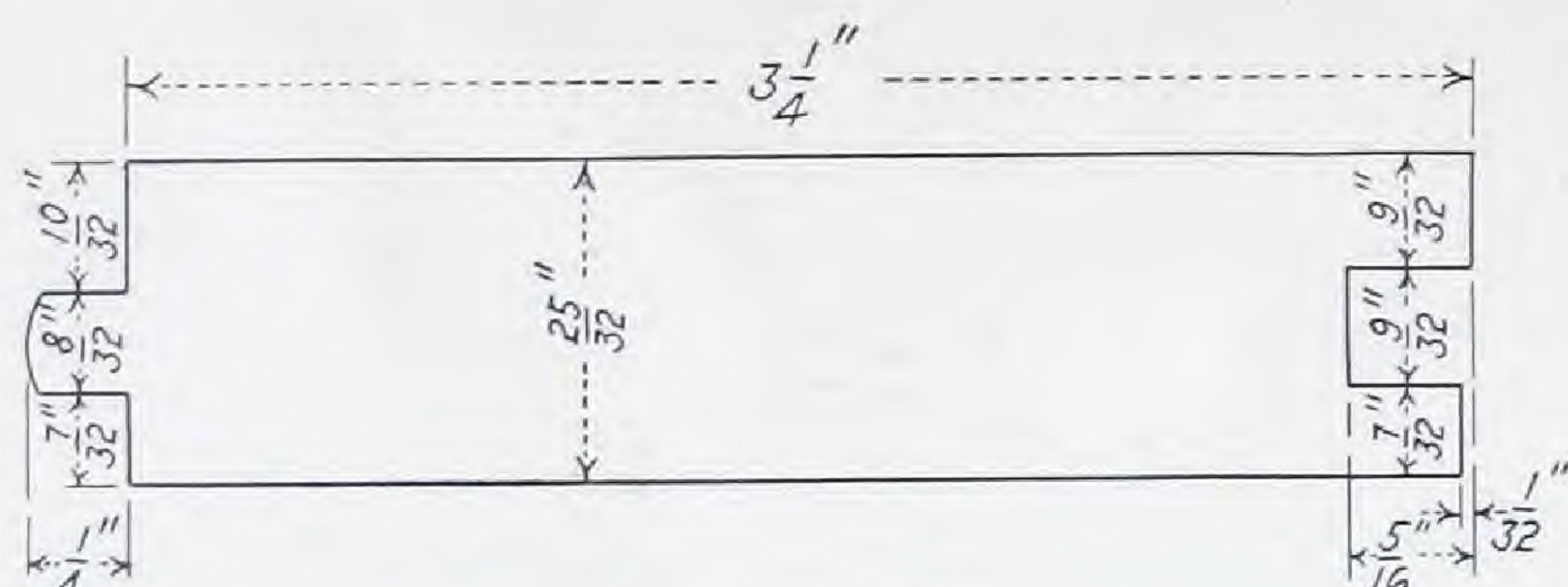


Figure 3—Standard Dimensions

## END-MATCHED STRIPS

Short length, end-matched flooring when installed over sub-flooring, can be laid as quickly and cheaply as full strip lengths with plain ends. The carpenter is required to make but one saw-cut at one wall for each full-length strip of flooring laid in the room. When laid, the flooring is well matched with finer joints than result from butt ends in the usual strip flooring. The benefits accruing from this utilization are: decreased cost of flooring to the consumer, economy in building costs, and a step toward conservation of timber resources in the forest.

## PATTERN FLOORS

Short-length flooring of selected edge-grain Southern Yellow Pine can also be utilized in the laying of design or pattern floors to produce a flooring that is distinctive and which can be stained any color desired to harmonize with the decorations (see Figs. 4 and 5). A

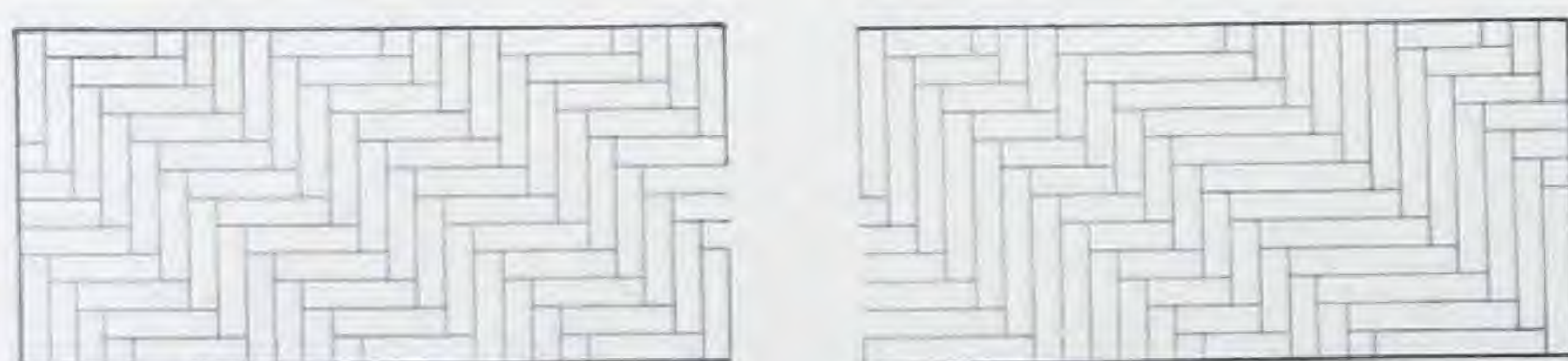


Figure 4—Patterns in Herringbone

floor of this kind will have beauty, individuality and durability at a slightly greater cost than the usual strip flooring. These patterns can be laid in squares, six to eighteen inches in dimension, using preferably the 2-3/8" face stock. Another pattern-floor than can be utilized is the Herring-bone design, which like the pattern in squares, can be laid in a variety of sizes. The pattern floor can be combined

with the usual strip flooring, using a strip border with a pattern field or a pattern border with a strip field.

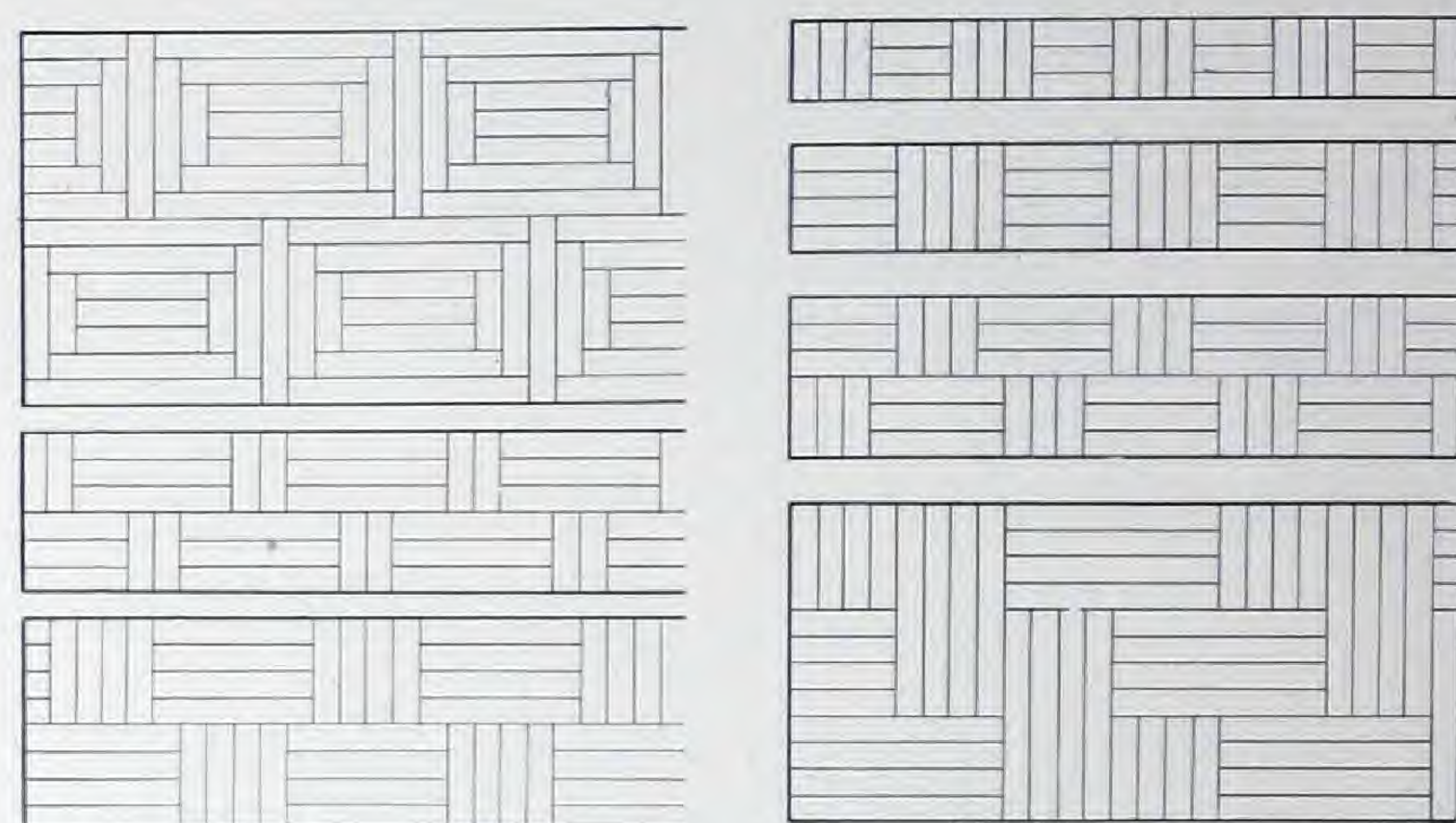


Figure 5—Patterns in Squares

## RECOMMENDED USE OF GRADES AND SIZES

SEVERAL kinds and grades of flooring are recommended for different types of construction. The selection of the kind and grade of flooring to be used will depend on the degree of dampness in the building and the amount of wear to which it is subjected. Resistance to wear is affected by the degree of dampness in the building which is classified as excessive and normal dampness. Floors are also classified as heavy and light duty floors according to the amount of wear caused by the nature of the occupancy and use.

### MILL CONSTRUCTION—CLASS I

FOR HEAVY DUTY AND EXCESSIVE DAMPNESS..	{ B. & better, heart edge-grain.
FOR HEAVY DUTY AND NORMAL DAMPNESS....	{ B. & better, edge-grain.
FOR LIGHT DUTY AND EXCESSIVE DAMPNESS..	{ B. & better, heart flat-grain.
FOR LIGHT DUTY AND NORMAL DAMPNESS....	{ B. & better, flat-grain.

### MILL CONSTRUCTION—CLASS II

FOR HEAVY DUTY AND EXCESSIVE DAMPNESS..	{ No. 1 common, heart edge-grain.
FOR HEAVY DUTY AND NORMAL DAMPNESS....	{ No. 1 common, edge-grain.
FOR LIGHT DUTY AND EXCESSIVE DAMPNESS..	{ No. 1 common, heart flat-grain.
FOR LIGHT DUTY AND NORMAL DAMPNESS....	{ No. 1 common, flat-grain.



# Southern Pine Association

## COMMERCIAL CONSTRUCTION—CLASS I

(Offices, Stores and Mercantile Buildings)

FOR HEAVY DUTY AND EXCESSIVE DAMPNESS.. { B. & better, heart edge-grain.

FOR LIGHT DUTY AND NORMAL DAMPNESS.... { B. & better, edge-grain.

## COMMERCIAL CONSTRUCTION—CLASS II

FOR HEAVY DUTY AND EXCESSIVE DAMPNESS.. { No. 1 common, heart edge-grain.

FOR HEAVY DUTY AND NORMAL DAMPNESS.... { No. 1 common, edge-grain.

FOR LIGHT DUTY AND EXCESSIVE DAMPNESS.. { B. & better, heart flat-grain.

FOR LIGHT DUTY AND NORMAL DAMPNESS.... { B. & better, flat-grain.  
No. 1 common, flat-grain.

FOR ORDINARY FLOORING No. 1 common, flat-grain.

## RESIDENTIAL CONSTRUCTION—CLASS I

FOR HALLWAYS, LIVING ROOMS, ETC..... { B. & better, heart edge-grain.  
B. & better, edge-grain.  
No. 1 common, edge-grain.

FOR KITCHENS (TO BE COVERED) ..... { B. & better, flat-grain.  
No. 1 common, heart flat-grain.  
No. 1 common, flat-grain.

FOR KITCHENS (TO BE UNCOVERED) ..... { No. 1 common, heart edge-grain.  
No. 1 common, edge-grain.  
No. 2 common, edge-grain.

FOR BEDROOMS ..... { B. & better, flat-grain.  
No. 1 common, edge-grain.  
No. 1 common, flat-grain.  
No. 2 common, edge-grain.

## RESIDENTIAL CONSTRUCTION—CLASS II

FOR HALLWAYS, LIVING ROOMS, ETC..... { B. & better, flat-grain.  
No. 1 common, edge-grain.

FOR KITCHENS (TO BE COVERED) ..... { No. 1 common, flat-grain.  
No. 2 common, flat-grain.

FOR KITCHENS (TO BE UNCOVERED) ..... { No. 1 common, heart edge-grain.  
No. 1 common, edge-grain.  
No. 2 common, edge-grain.  
No. 1 common, flat-grain.

FOR BEDROOMS ..... { No. 1 common, edge-grain.  
No. 1 common, flat-grain.  
No. 2 common, edge or flat grain.

NOTE—Owing to price advantages, it is sometimes possible to lay No. 2 common, edge or flat-grain flooring, with a maximum waste of 25 per cent and still secure, at a lower cost, a one grade higher finished floor.

## EXTERIOR PORCHES AND PLATFORMS

FOR COVERED PORCHES OR PLATFORMS..... { No. 1 common flat-grain.  
No. 2 common flat-grain.  
25/32" x 3-1/4" or 5-1/4"\*.

FOR UNCOVERED PORCHES NATURAL FINISH..... { B. & better, heart edge-grain.  
B. & better, heart flat-grain.  
No. 1 common, edge-grain.  
25/32", 1-1/16" or 1-5/16" stock.

## HOW TO LAY SOUTHERN YELLOW PINE FLOORS

### PROTECTION

Southern Yellow Pine flooring should not be exposed to moisture before it is laid. Do not, therefore, lay the top flooring in a new building until the masonry work and the plastering have had sufficient opportunity to dry out. It is preferable to postpone the laying of the top flooring until all interior finish, including wall-papering, is completed and thoroughly dry and the rooms have been warmed and dried out.

### SUB-FLOORS

The best results are obtained by laying the Southern Yellow Pine top flooring over a sub-floor, but in an old house the new floor can be laid directly over the old. The sub-floor, though not absolutely essential, makes a stronger and firmer building; insures warmer rooms; permits the finish flooring to run in any direction regardless of the floor joists underneath; and makes possible the utilization of short lengths. If there is no sub-floor, the butt ends of the top flooring must meet in full bearing on a joist to prevent squeaks or springs under pressure. In laying new flooring over old floors, all loose boards in the old flooring should be nailed down and all uneven spots levelled off and the new flooring laid preferably at an angle to the old flooring. With the sub-floor in place, the workmen may use this surface as a working ground and storage space

\*Spacing of porch joists should not exceed 16 inches for 25/32"-decking.



# Southern Pine Association

for materials. A floor of this kind is of equal value upstairs and down, and in parts of the country subject to heavy winds or cyclones, it is always desirable to place a diagonal sub-floor in the attic to strengthen the house, whether built of lumber, brick or hollow tile.

## WOOD JOIST CONSTRUCTION

Lay a sub-floor diagonally at 45 degrees of 25/32" dressed sheathing or shiplap of 4", 6" or 8" stock. Before laying the top-floor, the sub-floor should be thoroughly dried and cleaned

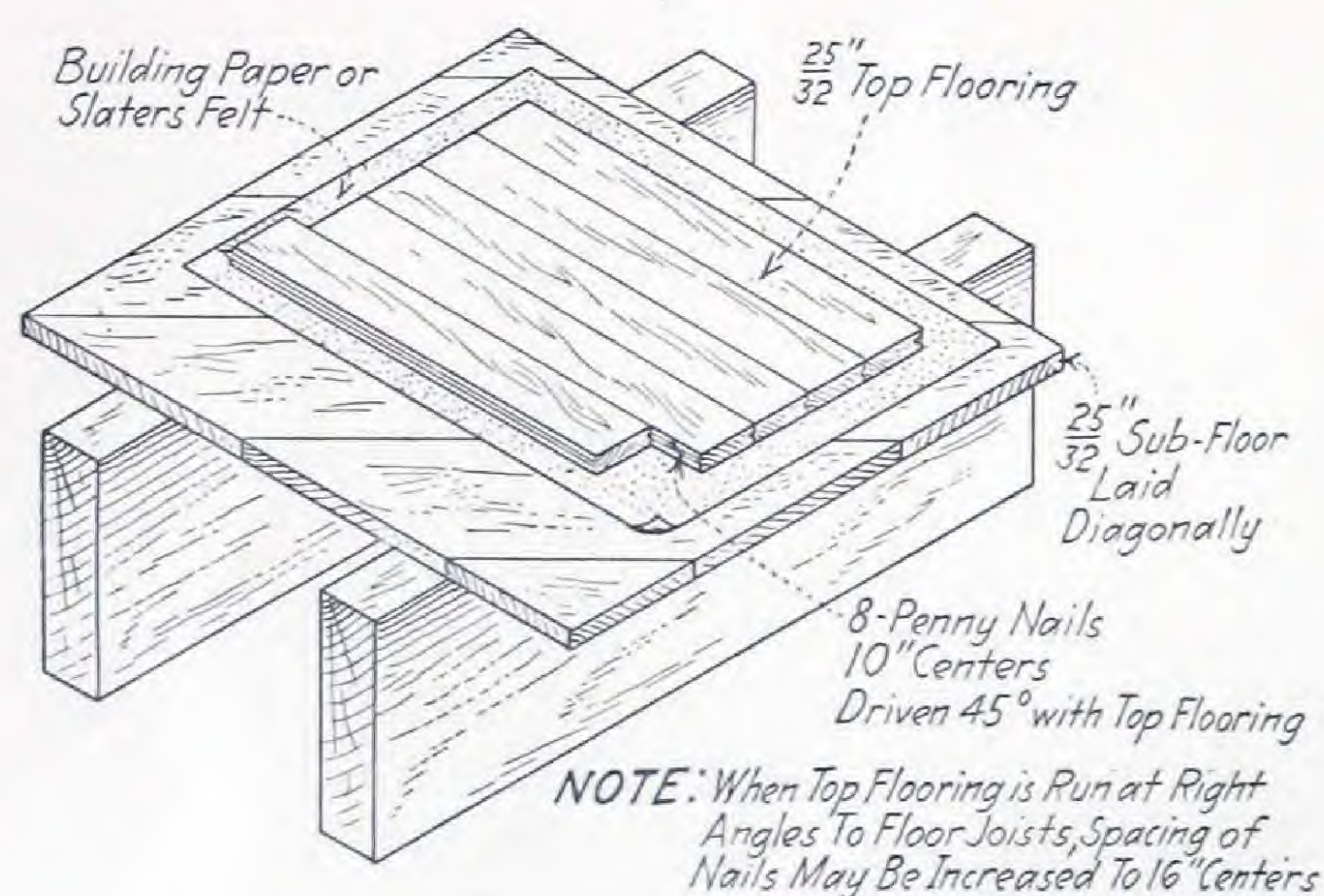


Figure 6—Wood Joist Floor Construction

and covered with a good red or black sized building paper or slater's felt. Bulging floors are frequently the result of inadequate nailing of the sub-floor. For boards up to 6" in width, use 2 nails per board in every floor joist. For boards wider than 6", use 3 nails per board per joist. For 25/32" stock, these nails should not be less than 2-1/2" long.

## NAILING

After all the interior finish of the house has been completed, the top flooring strips are laid, driven up tight and blindnailed with 8d steel-cut flooring nails, driven not more than 10" on centers, at an inclination of not more than 45 degrees to avoid spitting the flooring strips or forcing the joists or sub-floor.

In laying flooring strips, place a block or piece of straight edged hardwood against the tongue of the strip of flooring and with a heavy hammer force the strips together as tight as possible before the nails are driven. By doing this, damage to the surface of the

flooring by the hammer will be prevented. The use of alternately long and short pieces of flooring is recommended for economy, instead of pieces the full length of the room. (See Fig. 6.) The flooring is usually laid so that it will run the long way of the room and through the door openings from one room to another without breaking its continuity. If the direction or run of the strips changes in adjoining rooms, the flooring should be sawed off flush with the strip running at right angles. A door-saddle or threshold-strip may be used if desired.

## EXTERIOR DECKING

The flooring strips should be installed the short way of the porch or platform with sufficient slope to permit water drainage in the direction of the grain of the wood. Porch flooring which is exposed to excessive dampness should not be laid over a sub-floor or building paper. Before each strip is laid, the groove should be filled with pure white lead softened with linseed oil and the tongue of the next piece driven tightly into this, causing the lead to spread and fill the entire joint, oozing slightly below and above, and making the joint water-tight. For 25/32" decking, use 8d steel cut flooring nails; for 1-1/16" decking, use 10d nails; for 1-5/16" decking, use 12d nails.

As soon as the porch floor is laid, the first coat of paint should be applied to further protect the wood from moisture and sun. It is sometimes advisable to cover an upstairs veranda, sleeping porch or balcony with heavy ducking, fastened with lapped seams and copper nails, or with standard canvas-covered decking material made for this purpose, in which event the surface should be painted promptly. In any case, before porch floors are finally painted or canvas covered, all boards should be tight and evenly dressed.

## FIREPROOF ARCH CONSTRUCTION

Special attention should be given to the installation of Southern Yellow Pine floors on concrete foundations or on fireproof floor-arch construction to prevent their decay due to the presence of moisture in the concrete or incombustible filling on top of the arches and the unventilated condition of the space below the flooring. Such floors are usually nailed



# Southern Pine Association

to beveled wood sleepers embedded in the concrete foundation or in the cinder fill placed between the sleepers. The foundation or the fill usually absorbs moisture from various sources, such as the washing of the floors.

## PITCH COAT

To prevent decay in a floor subjected to light duty, cover the concrete foundation with a thin, even coating of coal tar pitch in which lay the sleepers and allow the pitch to harden. For heavy duty floors the beveled sleepers should be chemically treated to prevent dry rot and then embedded in the concrete foundation, after which apply the coating of coal tar pitch. Toenail the Southern Yellow Pine boards to the sleepers which are placed 12" or 16" on centers.

It is customary and desirable to use a sub-flooring as in non-fireproof construction. If, however, there is no sub-floor, the butt ends of the flooring must meet over a sleeper.

## CONCRETE FILL

When a fill of cinders, porous concrete or other incombustible materials is used, the sleepers must be thoroughly treated before embedment in the fill.\*

## COMPOSITION NAILING BASES

Several plastic forms of incombustible filling materials have been devised for installation over concrete slabs as a substitute for underflooring or as a nailing base for finished floors. For wood top-flooring, this nailing base should have a minimum thickness of 2" and must be screeded to a true and level surface.

\*For methods of laying heavy duty flooring in commercial and industrial buildings see Bulletin No. 5 of this series.

The size and number of nails must be not less than specified for wood sub-flooring. Where such base coats are subject to excessive moisture absorption, it is recommended that the underside of the wood flooring receive a coat of paint or chemical preservative.

## AMOUNT OF FLOORING REQUIRED

In estimating the amount in board feet of flooring required for a given space, compute the total number of square feet to be covered and add the following percentages:

25/32" Flooring—	26.32 per cent for 2-3/8" widths.
	—23.08 per cent for 3-1/4" widths.
	—14.29 per cent for 5-1/4" widths.
1-1/16" Flooring—	57.89 per cent for 2-3/8" widths.
	—53.85 per cent for 3-1/4" widths.
	—42.86 per cent for 5-1/4" widths.
1-5/16" Flooring—	89.47 per cent for 2-3/8" widths.
	—84.62 per cent for 3-1/4" widths.
	—71.43 per cent for 5-1/4" widths.
1-5/8" Flooring—	152.63 per cent for 2-3/8" widths.
	—146.15 per cent for 3-1/4" widths.
	—128.57 per cent for 5-1/4" widths.

## SPECIAL FLOORING PROBLEMS

**O**CCASIONS arise when unusual service or special requirements demand methods of installation that may differ from those recommended in this bulletin. Dance floors are sometimes required to be erected over fireproof construction in such manner as to make available the natural elasticity of the wood structure; roller skating rinks and automobile speedways have special requirements for the finished flooring. The Southern Pine Association maintains an architectural and engineering service to assist architects and engineers in solving special problems.





SOUTHERN PINE—GRADE-MARKED AND TRADE-MARKED